Understanding the Evolution of Religion: 
An Interdisciplinary Approach

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Turner’s paper covers an impressive scope of evidence and builds a complex theory of how both biological evolution and other evolutionary forces could give rise to human religions. Researchers in other areas of the biological and social sciences have explored similar ideas and have developed parallel theories, which in many ways expand upon the ideas presented here. The need for an evolutionary explanation of religion and the necessity of appealing to selection mechanisms beyond biological ones has been well established within the fields of biology, human ecology, anthropology, and psychology. Researchers have appealed to biological evolution, cultural evolution, and cultural group selection in explaining religion (Atran and Henrich 2010; Gervais et al. 2011; Johnson 2015; Norenzayan et al. 2016). These additional cultural evolutionary mechanisms, and the biological evolutionary mechanisms that have given rise to them, have been well established as processes underlying human culture more generally (see Boyd and Richerson 1985; Henrich and McElreath 2003; Richerson and Boyd 2005).

Specifically, work in these fields has established theories for the evolution of the human brain; how religion can be explained by a combination of biological and cultural evolution; and that cultural group selection has played an important role in this process and continues to play an important role in dictating which religious groups succeed and spread, and which decline and disappear. We appeal to some of this evidence and explore how it parallels, compliments, and adds to those that Turner outlines in his paper.

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The Evolution of Big Brains

Many researchers have shared Turner’s opinion that understanding the evolution of the human brain is an important starting point to understanding complex human cultural institutions like religion. Turner’s explanation for why humans evolved such a large brain focuses on the role of social emotions, which he suggests underlie the ability to form stronger group bonds and larger groups, among other things. Other researchers have focused more broadly on the role of social learning and theory of mind, the ability to represent and reason about other’s thoughts and intentions, as the foundations for our larger brains (Call and Tomasello 2008; Herrmann et al. 2007; Nagell et al. 1993; Tomasello et al. 2005). These theories make up what has become known as the cultural brain hypothesis. This hypothesis, as the name suggests, emphasizes that our immense ability to learn socially (i.e., from other people) and to accumulate culture is what separates us from other apes and has pushed the evolution of our larger brains (Henrich 2015; Herrmann et al. 2007).

The cultural brain hypothesis fits into the framework of dual inheritance theory and gene-culture coevolution (Henrich and McElreath 2007; Richerson and Boyd 2005). Like Turner, dual inheritance theory suggests that human culture creates an additional avenue for selection pressures on human evolution. Moreover, dual inheritance theory has explored the interaction between cultural and biological evolution. Dual inheritance theory makes the claim that the human genome and human culture have coevolved with both influencing the evolution of the other. Changing environmental conditions created the necessary selection pressures that pushed us into becoming an increasingly cultural species (Richerson and Boyd 2000). As our hominid ancestors became cultural, that culture began to change the environment they lived in and thus the type of genetic traits that were being selected for (Laland et al. 2010). A classic example of this is the shrinking of the digestive system after our ancestors began cooking food (Wrangham and Conklin-Brittain 2003). Since cooked food requires less energy to digest than raw, people who cooked food and devoted less energy to their digestive tract did better. This trait spread throughout the population. Over time, the human digestive tract became shorter because the cultural technology of cooking changed the evolutionary landscape. Relatedly, the expansion of the human brain is theorized to have been ratcheted up by social learning and cultural transmission (van Schaik and Burkart 2011; van Schaik et al. 2012; Whiten and van Schaik 2007). As human culture took off, those that could learn successful cultural technologies more reliably did better, selecting for more and more abilities that supported social and cultural learning.
Both the cultural brain hypothesis and Turner’s perspective claim that the ability to form strong social ties in increasingly larger groups is critical to understanding the origins of complex cultural institutions like religion. However, social emotions alone are not enough to create the sort of shared beliefs and norms these institutions require. Institutions like religion require a type of high fidelity copying of beliefs and behaviors that allow culture to accumulate over generations. These perspectives are not incompatible with the idea that social emotions are pre-adaptations for social and cultural learning, but they do expand on these ideas and lay a clearer theoretical foundation for the cultural evolution of phenomena like religion.

**Cumulative Culture and Cultural Evolution**

The ability to learn socially is not enough to explain the cultural complexity we see in humans. Social learning, and even basic culture, exists in many animal species (Lefebvre 2013). However, human culture is unique because it accumulates and can be built upon by each new generation (Boyd and Richerson 1996; Tomasello et al. 2005). This cumulative process of human culture allows for the more complex cultural technologies and institutions required for specific modes of cultural selection like those Turner outlined to operate.

This type of evolution is different than genetic evolution, not in the least because it, as Turner mentioned, can be guided and new variants can be more easily created. Humans can innovate with specific goals in mind, and unlike genetic selection, they can re-design a technology from scratch. At the same time, most cultural innovations happen at the population level and are not guided. The amount of credit we attribute to individual innovators for the creation of new knowledge, rather than population level processes, is almost certainly overestimated and due to our own culturally evolved biases (Muthukrishna and Henrich 2015).

Most of the processes by which we learn the beliefs and norms of our cultures have evolved to be fairly automatic (Chudek and Henrich 2011). These processes increase the probability that we are copying the most successful cultural traits in our environments by causing us to preferentially learn in certain ways, such as learning from prestigious individuals (i.e., those who other individuals pay attention to; Henrich and Gil-White 2001) conforming to the majority (Henrich and Boyd 1998), and to pay attention to credible behavioral displays of belief (Henrich 2009). Crucially, we learn cultural beliefs and norms without having to understand their function. This increases the efficiency of learning and allows for beneficial cultural traits, such as preparing food in a way that decreases food born illness, to accumulate and spread without anyone understanding the precise causal mechanisms underlying them. This also has important implications for the origins of

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faith (Henrich 2015). We dutifully uphold the beliefs and norms of our culture in a way that allows us to create and compile the complex beliefs, rituals and institutions that are present in the world religions we see today without needing to understand why (Norenzayan et al. 2016).

Cultural Group Selection

All of Turner’s non-biological modes of selection suggest some sort of group level selection processes. The idea that selection can act on cultural groups has been well explored in the domain of religion (Atran and Henrich 2010; Henrich 2004; Norenzayan et al. 2016; Wilson 2002). This sort of cultural group selection has been outlined in two different ways: The tendency for less successful groups to adopt the beliefs, practices and norms of a more successful group thus spreading those traits to new populations; and the tendency of some groups to overthrow other groups through conflict. These types of cultural group selection roughly correspond to Turner’s Durkheimian and Marxian selection. What existing theories of cultural group selection add to Turner’s account is a detailed theoretic and mathematic formalization of the prerequisite circumstances required for these processes to function and evolve in the first place (Henrich 2004).

Supernatural Monitoring

The connection between religion and morality is a topic of great interest, particularly to psychologists of religion. The necessity of institutions and punishment to support the level of large scale cooperation and group behavior of humans has also been well explored in human evolution (see Sigmund et al. 2010). In terms of religion, a large amount of empirical and theoretical work has gone into the role of supernatural monitoring and punishment in maintaining large scale societies (Atran and Henrich 2010; Henrich et al. 2010; Johnson 2015; Norenzayan 2013; Norenzayan et al. 2016; Norenzayan and Shariff 2008).

The ethnographic record reveals that the expansion of group size is often paired with the expansion and depth of beliefs regarding supernatural agents’ concern (Roes and Raymond 2003), knowledge and ability to sanction the behavior of individuals in regards to how they interact with each other (Norenzayan et al. 2016; Purzycki et al. 2016). Beliefs in moralizing supernatural monitors that can see, know and punish one’s actions even when other people cannot (and in some cultural instances even know one’s thoughts; Cohen and Rozin 2001) can aid in solving the problem of sustained cooperation.

These beliefs become particularly effective in curbing antisocial behaviors when packaged together with practices that can otherwise sustain tight bonds between
individuals. For instance, participation in ritual not only acts as a way to transmit normative information, but also signals and fosters a sense of group identity and commitment (Watson-Jones and Legare 2016). Importantly, evidence is quickly accumulating for the social bonding effects of ritual participation across diverse forms of ritual and cultures (e.g., Wiltermuth and Heath 2009; Xygalatas et al. 2013). Furthermore, these packages of beliefs and behaviors often become mutually-reinforcing (Alcorta and Sosis 2005). As outlined above, these packages can be propagated by cultural evolutionary processes that select for their effectiveness in sustaining interpersonal cooperation long before any given individual or institution understands this pairing.

Turner aptly suggests that there is more than just biology to religion. It is important to acknowledge that religious beliefs and practices take on the forms they do is because they are the products of, and constrained by, our evolved psychology. For instance, despite the variety of forms they can take on, supernatural monitoring beliefs can serve the shared function of sustaining cooperation across cultural boundaries (e.g., Purzycki et al. 2016). This causes these types of beliefs, and the groups that hold them, to spread more widely. Dual inheritance theory can account for this complex interaction between the cultural and biological processes required for such a system to evolve and can make precise predictions about how the various pieces of the puzzle of religion come together across the biological, psychological, and socio-cultural levels of analysis.

Conclusions

Different social science disciplines converging on similar evolutionary origins for something as complex as religion is quite compelling. It suggests a certain robustness to these concepts. At the same time, it points out the need for more cross-disciplinary communication and collaboration so as to avoid doubling the effort of other researchers. Each of these disciplines offers a unique perspective on human phenomena, and when dealing with complex systems like religion, our understanding will be richer for paying attention to as many of them as possible.

References


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